

Remarks/Arguments:

Claims 1-4, 9-20, 25-31, and 48 - 50 remain for consideration in this application with claims 1, 16, 48, 49, and 50 being in independent format. Claims 48-50 have been added in this amendment. In view of the claims as they now stand, together with the remarks hereunder, the rejections of the last office action must be respectfully traversed.

Claims 1, 2, 4, and 9-12 were rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 5,907,075 to Subramaniam et al. (Subramaniam). Claim 1 requires that the reaction be carried out under near-critical or supercritical reaction conditions relative to the reactant mixture. The remarks then noted that the prior art reaction schemes were carried out at near-or supercritical conditions relative to the reaction mixture. In the Action, it was alleged that when the reactants are fed to the reactor, the reactant mixture is the reaction mixture because the product has not yet been produced. In response, applicants submit a declaration from Dr. Bala Subramaniam, one of the inventors of the present application and of the cited reference, which notes that such an allegation is not true. Temperatures that are near-critical or supercritical relative to the reaction mixture are different from temperatures that are near-critical or supercritical relative to the reactant mixture. This is because the reaction mixture also includes the reaction products (i.e. the C₈ alkylation products among others). If the conditions are supercritical relative to the reaction mixture, such conditions keep all species in a single homogenous phase thereby preventing the desired separation of the heavier products, (which preferentially collect in the macropores using the methods of the present invention) from the C₈ alkylation products. In contrast, if the process keeps temperatures in the supercritical range relative to the reactant

mixture, the desired separation of the C₈ alkylation products occurs and the heavier products collect in the macropores of the catalyst.

As set forth in that declaration, one of skill in the art, upon reading the present specification, would consider the reactant mixture and the reaction mixture as two distinct fluids and would not consider the reaction mixture to be the reactant mixture as it was fed into the reactor. Thus, temperatures near-critical or supercritical to the reactant mixture would be different from temperatures near or supercritical relative to the reaction mixture. Temperatures that are supercritical to the reaction mixture are those above the critical temperature of the reaction mixture with a specific composition. As a result of these differences, the present invention achieves the goal of separating the C₈ alkylation products in the reaction mixture. Accordingly, applicants assert that this rejection should be withdrawn.

Claim 3 was rejected under 35 U.S.C. 103(a) as obvious over Subramaniam in view of U.S. Patent No. 4,056,578 to McClure et al. (McClure). As noted above, Subramaniam does not teach or suggest that the reaction be carried out at conditions that are near-critical or supercritical to the reactant mixture. McClure adds nothing in this regard and so it cannot be said that the combination of Subramaniam and McClure provide the required teaching or suggestion. Accordingly, applicants assert that this rejection should be withdrawn.

Claims 13-18, 20, and 25-31 were rejected under 35 U.S.C. 103(a) as obvious over Subramaniam in view of U.S. Patent No. 5,491,278 to Angstadt et al. (Angstadt). It was admitted that neither of these references taught or suggested lowering the temperature within the reactor in order to effect at least partial removal of coke from said catalyst during any catalyst regeneration step. Additionally, it was admitted that each of these references was silent as to the

raising the pressure step. However, it was alleged that one of ordinary skill in the art would be able to optimize the reaction by selecting the appropriate temperature and pressure. Applicants note that "obvious to try" is not the standard for obviousness. Moreover, the cited art actually teaches away from increasing the pressure or lowering the temperature as Angstadt suggests to do the opposite, that is to decrease the pressure or increase the temperature. Such is the disclosure in column 5, line 27 to column 6, line 19 which describes the reaction and catalyst regeneration. Subramaniam is silent as to either of these steps. Taking these teachings, one of skill in the art would be inclined to decrease the pressure, increase the temperature or both, while the claims require just the opposite. This is significant because the effect of lowering the reactor temperature or increasing the pressure within the reactor is that the density of the reaction mixture increases, which thereby, as found by the inventors, permits the desired extraction of the retained heavy products from the pores following a reaction cycle. As noted above, there are no teachings in the art to increase this density by any means and Angstadt suggests doing the opposite, that is to decrease the pressure or increase the temperature. The declaration of Dr. Subramaniam notes that one of skill in the art, upon reading the cited references would not have been motivated to increase the pressure or decrease the temperature because the references teach exactly the opposite steps. Moreover, one of skill in the art would also not have been motivated to increase the density of the reaction mixture, which is the result of lowering the temperature or increasing the pressure. In view of these arguments, applicants respectfully request that this rejection be withdrawn.

Claim 19 was rejected under 35 U.S.C. 103(a) as obvious over Subramaniam in view of Angstadt and further in view of McClure. McClure does not teach or suggest the required portion of the regenerating step that is required by claim 16, from which this claim depends.


Accordingly, it cannot be said that this combination of references obviates claim 19 and applicants respectfully request that this rejection be withdrawn.

New claims 48-50 are similar to claim 16. In claim 48, the pressure step has been removed, thereby leaving just the step of lowering the temperature during the regeneration step. As noted above, neither of the cited references disclosed such a step and Angstadt taught to increase the temperature. Claim 49 is limited to an alkylation reaction wherein the reaction includes isoparaffin, an olefin, and a molar excess of an inert co-solvent or diluent as reactants. The temperature and pressure limitations of claim 16 are retained in this new claim. Finally, claim 50 replaces the "elevating the pressure and/or decreasing the temperature" portion of the regenerating step with "increasing the density of said reaction mixture." As noted above, the effect of elevating the pressure or decreasing the temperature of the reaction mixture results in an increase of the density of the reaction mixture. Again, none of the cited references taught or suggested such a step. This phrase has been substituted into this claim. Accordingly, applicants assert that claims 48-50 are allowable over the art of record.

Any additional fee which is due in connection with this amendment should be applied against our Deposit Account No. 19-0522.

In view of the foregoing, a Notice of Allowance appears to be in order and such is courteously solicited.

Respectfully submitted,

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